

TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

**TD62064P, TD62064AP, TD62064F, TD62064AF**  
**TD62074P, TD62074AP, TD62074F, TD62074AF**

**4CH HIGH-CURRENT DARLINGTON SINK DRIVER**

The TD62064P/AP/F/AF and TD62074P/AP/F/AF are high-voltage, high-current darlington drivers comprised of four NPN darlington pairs.

All units feature integral clamp diodes for switching inductive loads and all units of TD62074P/AP/F/AF feature uncommitted collectors and emitters for isolated darlington applications.

For proper operation, the substrate (SUB) must be connected to the most negative voltage.

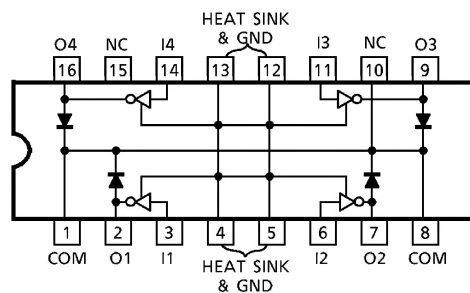
Applications include relay, hammer, lamp and stepping motor drivers.

**FEATURES**

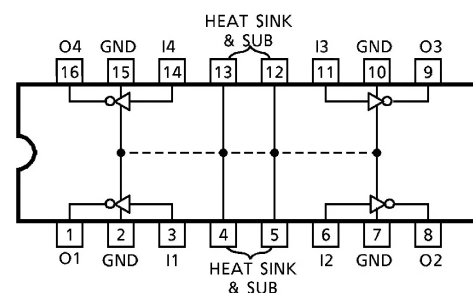
- Output current (single output) 1.5A (Max.)
- High sustaining voltage output  
35V (Min.) (TD62064P/F, 074P/F)  
50V (Min.) (TD62064AP/AF, 074AP/AF)
- Output clamp diodes : TD62064P/AP/F/AF
- Isolated darlington array : TD62074P/AP/F/AF
- Input compatible with TTL and 5V CMOS
- GND and SUB terminal = heat sink
- Package type-P, AP : DIP-16pin
- Package type-F, AF : HSOP-16pin

**PIN CONNECTION (TOP VIEW)**

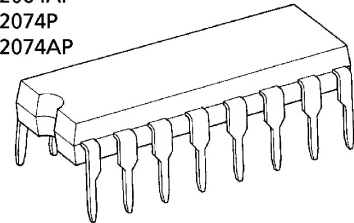
TD62064P/AP



TD62074P/AP

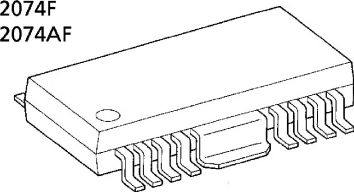


TD62064P  
TD62064AP  
TD62074P  
TD62074AP



DIP16-P-300-2.54A

TD62064F  
TD62064AF  
TD62074F  
TD62074AF



HSOP16-P-300-1.00

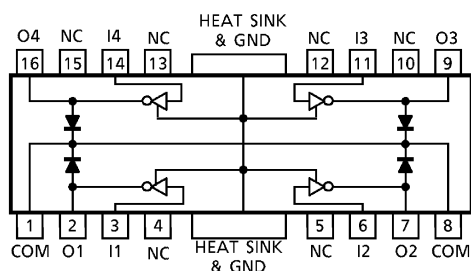
**Weight**

DIP16-P-300-2.54A : 1.11g (Typ.)  
HSOP16-P-300-1.00 : 0.50g (Typ.)

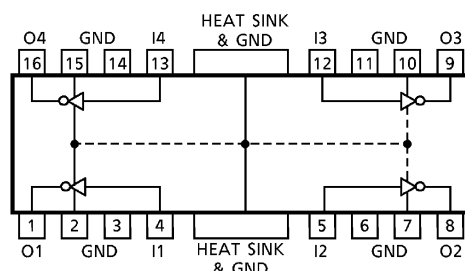
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**TD62064F / AF**

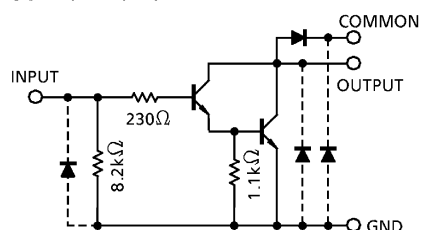


**TD62074F / AF**

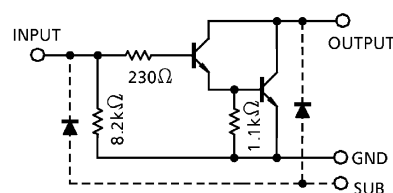


**SCHEMATICS (EACH DRIVER)**

**TD62064P / AP / F / AF**



**TD62074P / AP / F / AF**



(Note) The input and output parasitic diodes cannot be used as clamp diodes.

**MAXIMUM RATINGS (Ta = 25°C)**

CHARACTERISTIC		SYMBOL	RATING	UNIT
Output Sustaining Voltage	P, F	$V_{CE(SUS)}$	- 0.5~35	V
	AP, AF		- 0.5~50	
Output Current		$I_{OUT}$	1.5	A / ch
Input Current		$I_{IN}$	50	mA
Input Voltage		$V_{IN}$	- 0.5~17	V
Clamp Diode Reverse Voltage	P, F	$V_R$ (Note 1)	35	V
	AP, AF		50	
Clamp Diode Forward Current		$I_F$ (Note 1)	1.5	A / ch
Isolated Voltage	P, F	$V_{SUB}$ (Note 2)	35	V
	AP, AF		50	
Power Dissipation	P, AP	$P_D$	1.47 / 2.7 (Note 3)	W
	F, AF		0.9 / 1.4 (Note 4)	
Operating Temperature		$T_{opr}$	- 40~85	°C
Storage Temperature		$T_{stg}$	- 55~150	°C

(Note 1) TD62064P / AP / F / AF

(Note 2) TD62074P / AP / F / AF

(Note 3) On Glass Epoxy (50 × 50 × 1.6mm Cu 50%)

(Note 4) On Glass Epoxy (60 × 30 × 1.6mm Cu 30%)

## RECOMMENDED OPERATING CONDITIONS (Ta = -40~85°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Output Sustaining Voltage	P, F	V <sub>CE (SUS)</sub>			0	—	35	V
	AP, AF				0	—	50	
Output Current		I <sub>OUT</sub>	DC1 Circuit, Ta = 25°C		0	—	1250	mA / ch
			T <sub>pw</sub> = 25ms 4 Circuits T <sub>j</sub> = 120°C Ta = 85°C	Duty = 10%	0	—	1250	
				Duty = 50%	0	—	390	
				Duty = 10%	0	—	907	
				Duty = 50%	0	—	172	
Input Voltage		V <sub>IN</sub>			0	—	8	V
	(Output On)	V <sub>IN (ON)</sub>	I <sub>OUT</sub> = 1.25A		2.5	—	8	V
	(Output Off)	V <sub>IN (OFF)</sub>			0	—	0.4	V
Input Current		I <sub>IN</sub>			0	—	20	mA
Clamp Diode Reverse Voltage	P, F	V <sub>R</sub>	TD62064P / AP / F / AF		0	—	35	V
	AP, AF				0	—	50	
Clamp Diode Forward Current		I <sub>F</sub>			—	—	1.25	A
Isolation Voltage	P, F	V <sub>SUB</sub>	TD62074P / AP / F / AF		—	—	35	V
	AP, AF				—	—	50	
Power Dissipation	P, AP	P <sub>D</sub>	Ta = 85°C (Note 1)		—	—	1.4	W
	F, AF		Ta = 85°C (Note 2)		—	—	0.7	

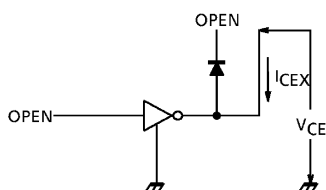
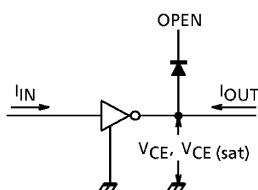
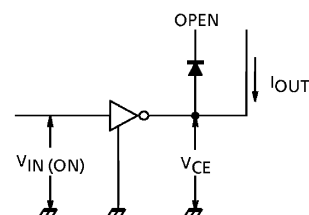
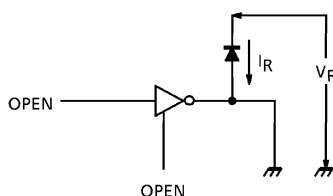
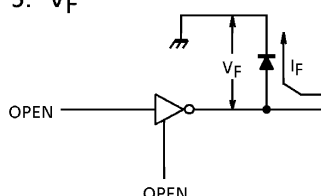
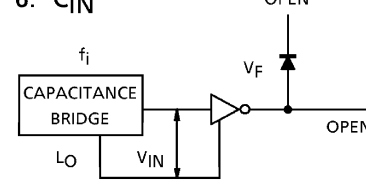
(Note 1) On Glass Epoxy (50×50×1.6mm Cu 50%)

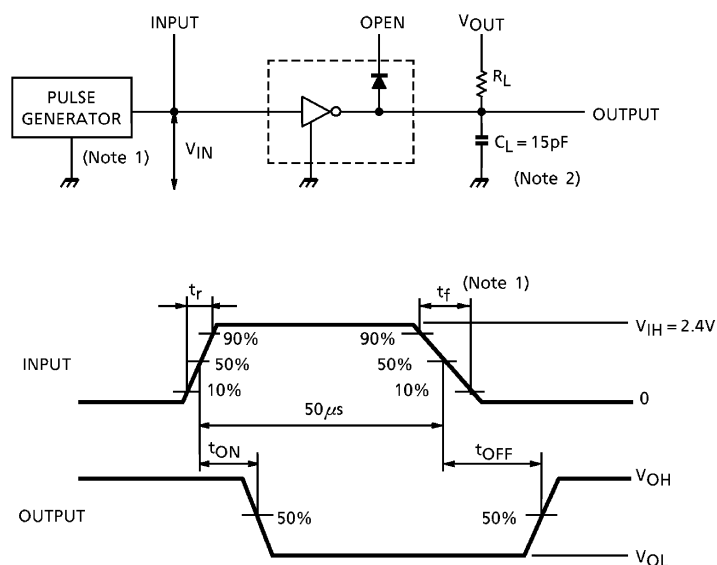
(Note 2) On Glass Epoxy (60×30×1.6mm Cu 30%)

## ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CIRCUIT	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Output Leakage Current	AP, AF	I <sub>CEX</sub>	1	V <sub>CE</sub> = 50V, T <sub>a</sub> = 25°C		—	—	50	μA
	V <sub>CE</sub> = 50V, T <sub>a</sub> = 85°C			—	—	500			
	V <sub>CE</sub> = 35V, T <sub>a</sub> = 25°C			—	—	50			
	V <sub>CE</sub> = 35V, T <sub>a</sub> = 85°C			—	—	500			
Collector-Emitter Saturation Voltage		V <sub>CE (sat)</sub>	2	I <sub>OUT</sub> = 1.25A, I <sub>IN</sub> = 2mA		—	—	1.6	V
				I <sub>OUT</sub> = 0.75A, I <sub>IN</sub> = 935μA		—	—	1.25	
DC Current Transfer Ratio		h <sub>FE</sub>	2	V <sub>CE</sub> = 2V	I <sub>OUT</sub> = 1.0A	—	800	—	
					I <sub>OUT</sub> = 0.25A	—	1500	—	
Input Voltage (Output On)		V <sub>IN (ON)</sub>	3	I <sub>OUT</sub> = 1.25A, I <sub>IN</sub> = 2mA		—	—	2.4	V
Clamp Diode Leakage Current	AP, AF	I <sub>R</sub>	4	V <sub>R</sub> = 50V, T <sub>a</sub> = 25°C		—	—	50	μA
	V <sub>R</sub> = 50V, T <sub>a</sub> = 85°C			—	—	100			
	F			V <sub>R</sub> = 35V, T <sub>a</sub> = 25°C		—	—	50	
				V <sub>R</sub> = 35V, T <sub>a</sub> = 85°C		—	—	100	
Clamp Diode Forward Voltage		V <sub>F</sub>	5	I <sub>F</sub> = 1.25A		—	—	2	V
Input Capacitance		C <sub>IN</sub>	6	V <sub>IN</sub> = 0V, f = 1MHz		—	15	—	pF
Turn-On Delay	P, F	t <sub>ON</sub>	7	C <sub>L</sub> = 15pF	V <sub>OUT</sub> = 35V R <sub>L</sub> = 29Ω	—	0.1	—	μs
	AP, AF				V <sub>OUT</sub> = 50V R <sub>L</sub> = 42Ω				
Turn-Off Delay	P, F	t <sub>OFF</sub>			V <sub>OUT</sub> = 35V R <sub>L</sub> = 29Ω	—	1.0	—	
	AP, AF				V <sub>OUT</sub> = 50V R <sub>L</sub> = 42Ω				

## TEST CIRCUIT

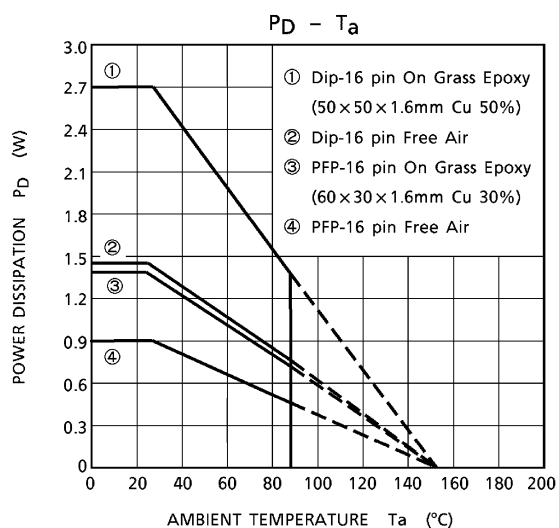
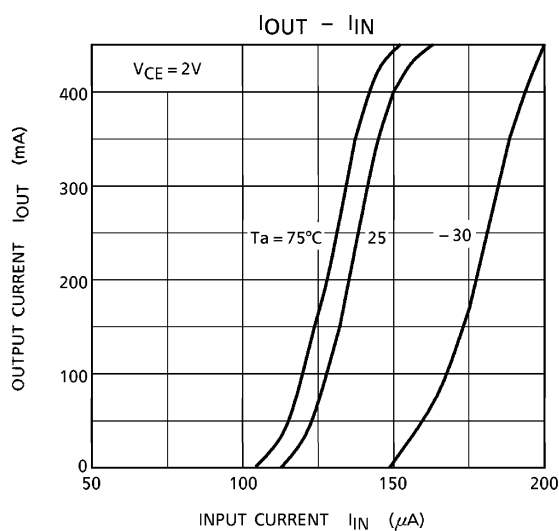
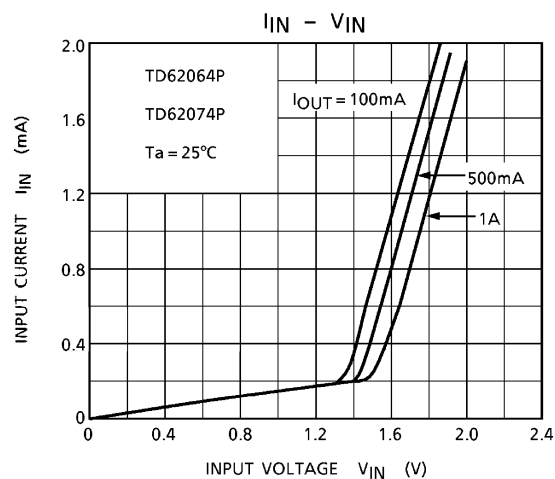
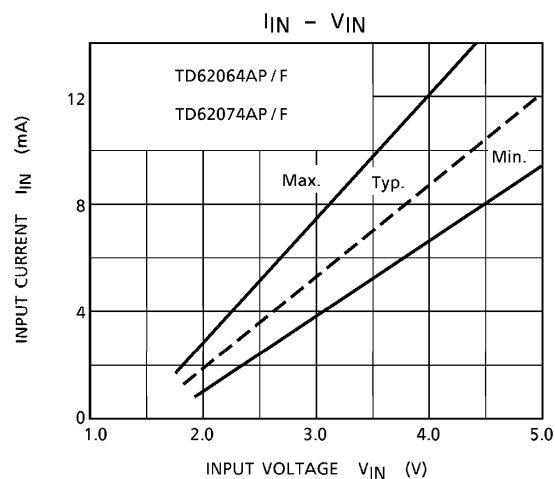
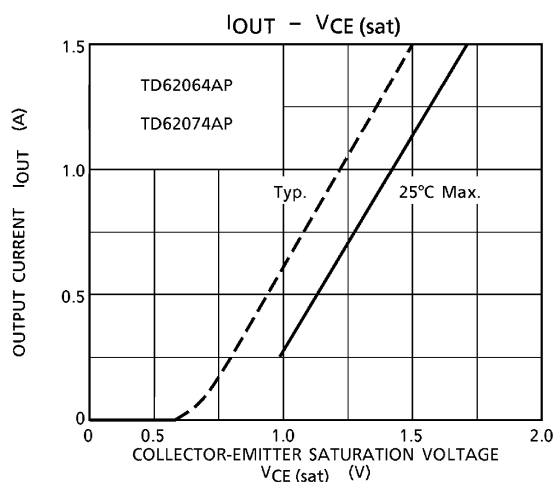
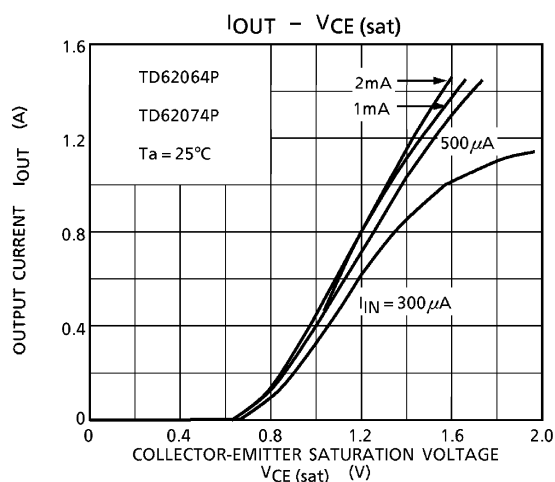
1.  $I_{CEX}$ 2.  $V_{CE(sat)}$ ,  $h_{FE}$ 3.  $V_{IN(ON)}$ 4.  $I_R$ 5.  $V_F$ 6.  $C_{IN}$ 

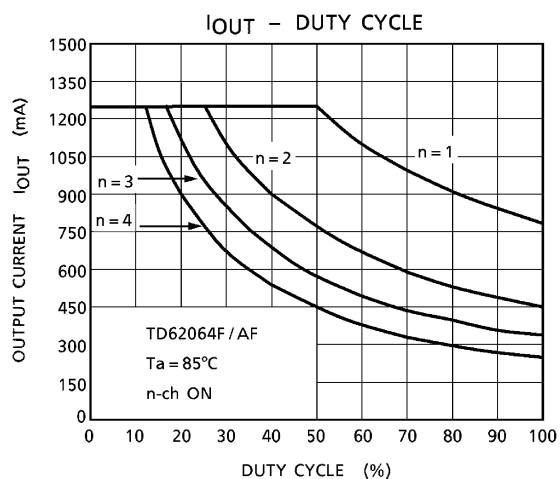
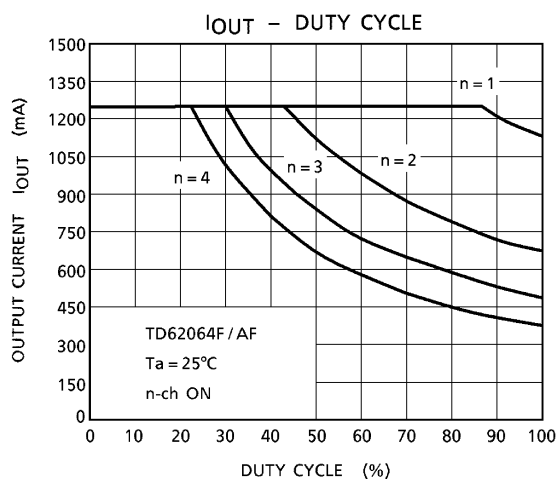
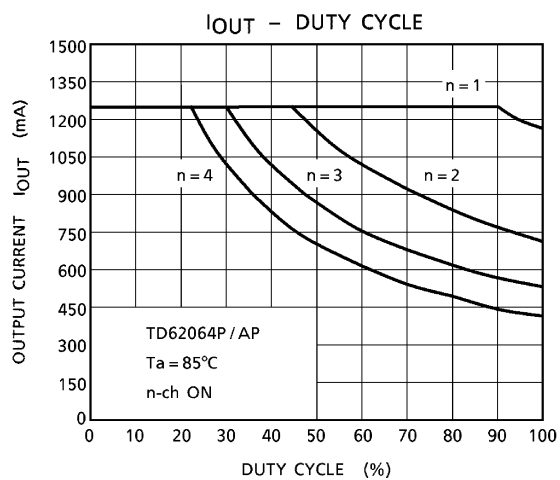
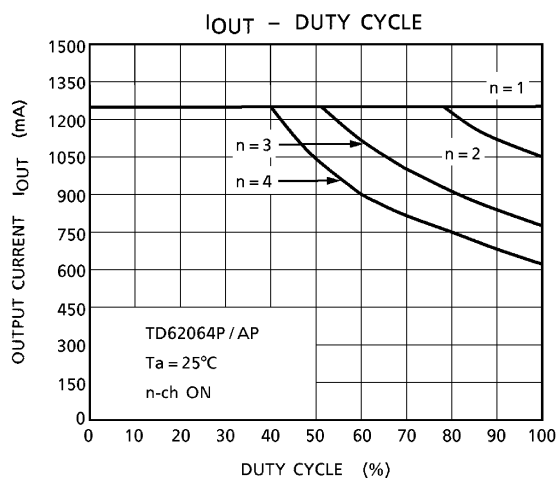
7.  $t_{ON}$ ,  $t_{OFF}$ 


- (Note 1) Pulse Width  $50\mu\text{s}$ , Duty Cycle 10%  
 Output Impedance  $50\Omega$ ,  $t_r \leq 5\text{ns}$ ,  $t_f \leq 10\text{ns}$   
 (Note 2)  $C_L$  includes probe and jig capacitance

## PRECAUTIONS for USING

Utmost care is necessary in the design of the output line, COMMON and GND line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.

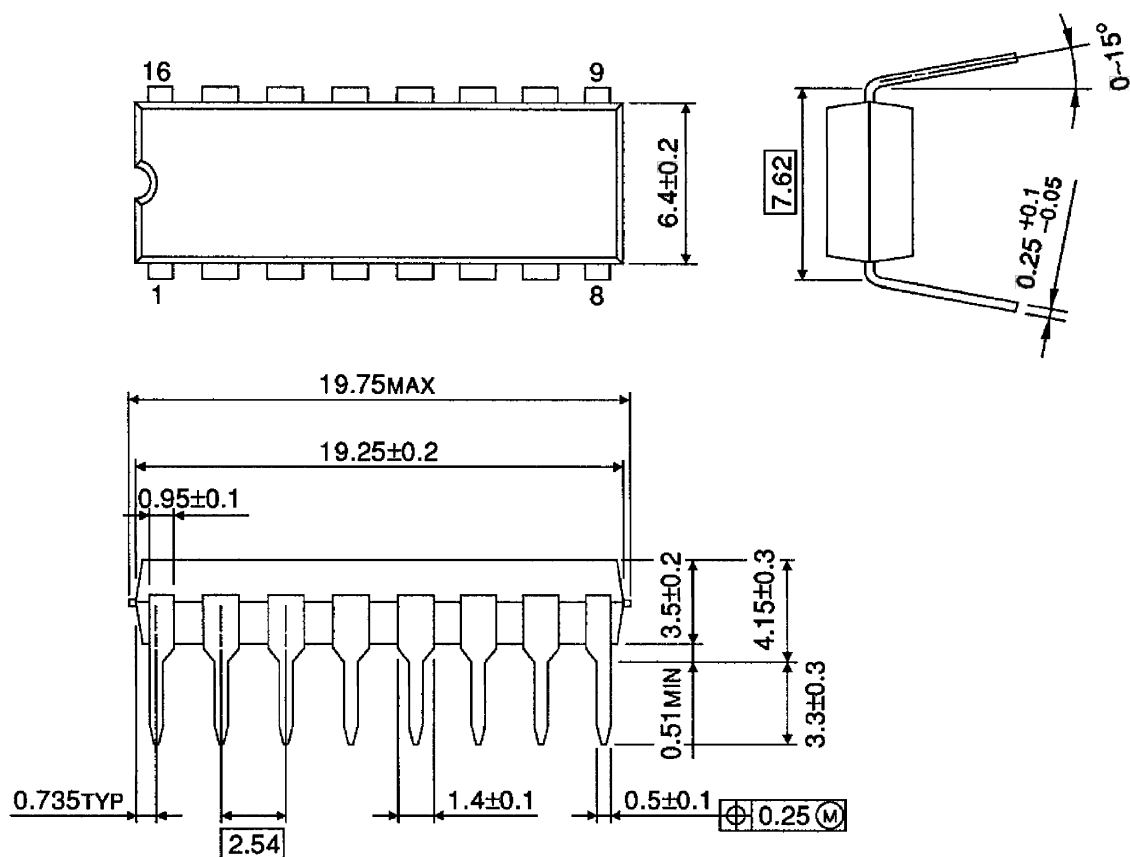




**OUTLINE DRAWING**

DIP16-P-300-2.54A

Unit : mm



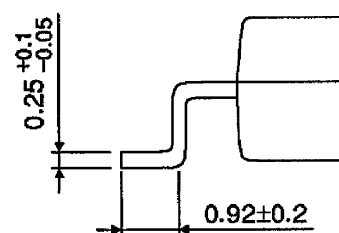
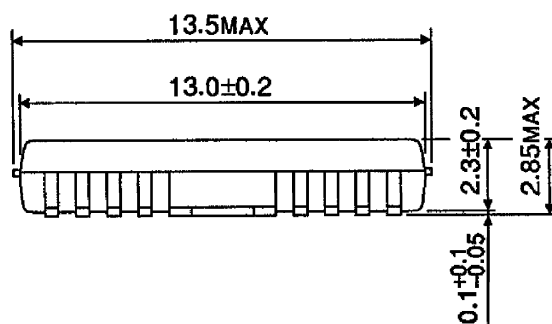
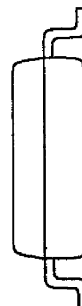
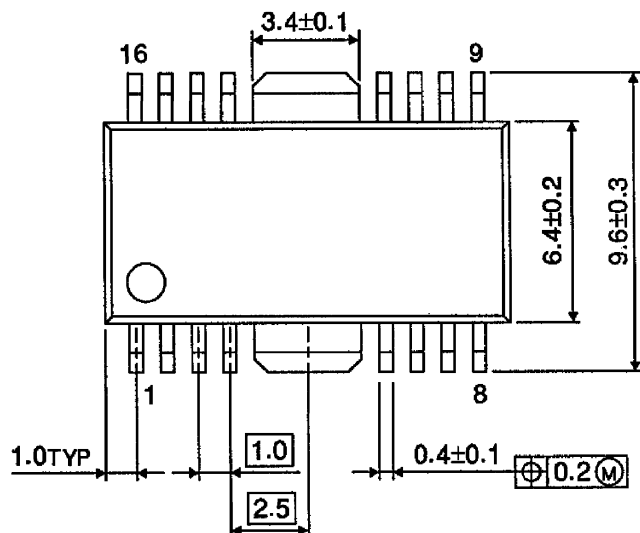
Weight : 1.11g (Typ.)



**OUTLINE DRAWING**

HSOP16-P-300-1.00

Unit : mm



Weight : 0.50g (Typ.)